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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,931	03/15/2004	John Thomas Conteras	HSJ920030271US1	9559

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EXAMINER

HABERMEHL, JAMES LEE

ART UNIT PAPER NUMBER

2651

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/800,931	Applicant(s) CONTERAS ET AL.	
	Examiner James L. Habermehl	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 12, 15-18 and 27 is/are rejected.
- 7) ☒ Claim(s) 4-11, 13, 14, 19-26, 28 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>15 Mar 05</u> | 6) <input type="checkbox"/> Other: _____ |

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1. This Office action is in response to application papers filed 15 March 2004, which papers have been placed of record in the file.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 12, 15-18, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloodworth et al. Bloodworth et al. meets all the limitations of claims 1 and 15-16, except it does not show that the heater current controller outputs a control current in response to the input signal. Bloodworth et al. Figures 1 and 5 shows a plurality of sliders with read and write elements, a read/write electronics modules 10 including a heater current controller 10FHC' receiving an input signal from 32R and outputting a control voltage from SS DAC 36 in response to the input signal, and a multiplexer 60 coupling the control voltage to a heating element 30_n associated with a write element on a selected slider body in a read operation, the heating element dissipating power proportional to the input signal causing a spacing decrease proportional to the input signal (paragraphs 0016-0017).

It is well known in the art of heater control to use either a voltage controlled device or a current controlled device to control the current through the heating element, and the examiner takes Official Notice of the equivalence of a voltage controller outputting a control voltage and a current controller outputting a control current for their use in the heater control art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select either one of these two known equivalents to use in the flying height controller of Bloodworth et al. to control the current to the heating element.

Regarding claims 2-3 and 17-18, whether the input signal is an input voltage or an input current would depend on which of the two obvious equivalents disclosed above was used in the heater current controller, and hence their selection is also obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claims 12 and 27, Bloodworth et al. shows a common voltage level generator having an output connected to the heating element because it shows a common ground.

4. Claims 4-11, 13-14, 19-26, and 28-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Claims 4 and 19 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a slider flying-height controller and a hard disk drive comprising the heater current controller includes a square-root circuit receiving the input current and outputting a first current that is proportional to the square root of the input

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current, and the control current is proportional to the first current, as presented in the environment of claims 4 and 19. The closest prior art, Bloodworth et al., shows slider fly height control similar to the claimed invention, including heater current control. However, Bloodworth et al. fails to disclose the heater current controller includes a square-root circuit receiving the input current and outputting a first current that is proportional to the square root of the input current, and the control current is proportional to the first current as claimed.

Claim 11 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a slider flying-height controller and a hard disk drive comprising the input signal is generated by a digital-to-analog converter based on selected data input to the digital-to-analog converter, as presented in the environment of claim 11. The closest prior art, Bloodworth et al., shows slider fly height control similar to the claimed invention, including heater current control. However, Bloodworth et al. fails to disclose the input signal is generated by a digital-to-analog converter based on selected data input to the digital-to-analog converter as claimed.

Claims 13 and 28 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a slider flying-height controller and a hard disk drive comprising the common voltage level is a potential different from ground, as presented in the environment of claims 13 and 28. The closest prior art, Bloodworth et al., shows slider fly height control similar to the claimed invention, including heater current control. However, Bloodworth et al. fails to disclose the common voltage level is a potential different from ground as claimed.

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Claims 14 and 29 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a slider flying-height controller and a hard disk drive comprising the common voltage level is selected to maximize a voltage headroom for the heating element, as presented in the environment of claims 14 and 29. The closest prior art, Bloodworth et al., shows slider fly height control similar to the claimed invention, including heater current control. However, Bloodworth et al. fails to disclose the common voltage level is selected to maximize a voltage headroom for the heating element as claimed.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Satoh et al., Kurita et al., and Smith show heater current control similar to applicant's invention.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James L. Habermehl whose telephone number is (571)272-7556. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571)272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Habermehl/jlh
2 Oct 05



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SUPERVISORY PATENT EXAMINER
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